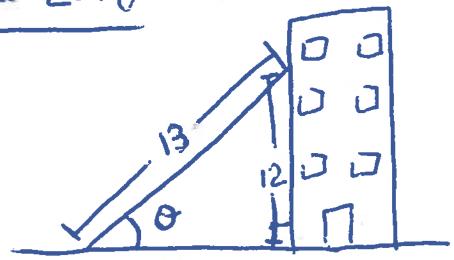
HW7 MATH 1540 Fall 2018

Section 8.3

#53



We see that

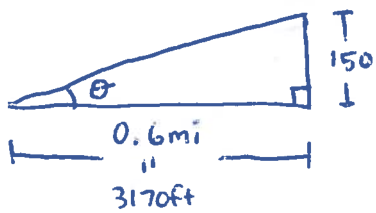
$$\sin(\theta) = \frac{12}{13}$$

Taking $\sin^{-1}$ of both sides yields

$$\sin^{-1}(\sin(\theta)) = \sin^{-1}\left(\frac{12}{13}\right)$$

$$\theta = \sin^{-1}\left(\frac{12}{13}\right) \approx 1.176 \text{ rad}$$

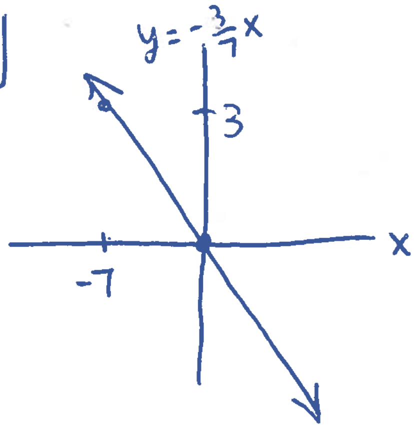
#54

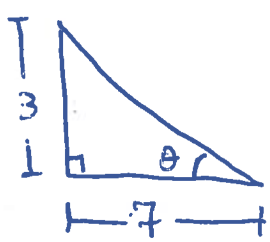


$$\tan(\theta) = \frac{150}{3170} \longrightarrow \theta = \tan^{-1}\left(\frac{150}{3170}\right)$$

$$\approx 0.04728$$

#59

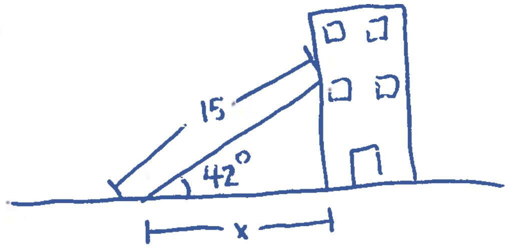




$$\tan(\theta) = \frac{3}{7}$$

$$\theta = \tan^{-1}\left(\frac{3}{7}\right) \approx 0.4048$$

#62



$$\cos(42^\circ) = \frac{x}{15}$$

$$x = 15\cos(42^\circ) \approx 11.15$$

Section 9.1 #11

$$-\tan(-x)\cot(-x) = -\frac{\cancel{\sin(-x)}}{\cancel{\cos(-x)}}\frac{\cancel{\cos(-x)}}{\cancel{\sin(-x)}} = -1$$

#12

$$\frac{-\sin(-x)\cos(x)\sec(x)\csc(x)\tan(x)}{\cot(x)}$$

$$= \frac{-(-\sin(x))\cancel{\cos(x)}\cdot\frac{1}{\cancel{\cos(x)}}\cdot\frac{1}{\cancel{\sin(x)}}\cdot\frac{\cancel{\sin(x)}}{\cos(x)}}{\frac{\cos(x)}{\sin(x)}}$$

$$= \frac{\frac{\sin(x)}{\cos(x)}}{\frac{\cos(x)}{\sin(x)}} = \left(\frac{\sin(x)}{\cos(x)}\right)\left(\frac{\sin(x)}{\cos(x)}\right) = \frac{\sin^2(x)}{\cos^2(x)}$$

#15

$$\frac{1-\cos^2(x)}{\tan^2(x)} + 2\sin^2(x) = \frac{1-\cos^2(x)}{\frac{\sin^2(x)}{\cos^2(x)}} + 2\sin^2(x)$$

from $\cos^2(x)+\sin^2(x)=1$
$\rightarrow 1-\cos^2(x) = \sin^2(x)$

$$= \cancel{\sin^2(x)}\left(\frac{\cos^2(x)}{\cancel{\sin^2(x)}}\right) + 2\sin^2(x)$$

$$= \underbrace{\cos^2(x) + \sin^2(x)}_{=1} + \sin^2(x)$$

$$= 1 + \sin^2(x)$$